AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraphs beginning at page 1, lines 6-12, as follows:

~~FIELD OF THE INVENTION~~ TECHNICAL FIELD

The ~~present invention~~ technical field relates to arrangements and method in a third generation mobile telecommunication system and evolved variants thereof. In particular, the ~~invention~~ technical field relates to arrangements and method for handling macro diversity in a UMTS Radio Access Network (UTRAN) transport network.

BACKGROUND ~~OF THE INVENTION~~

Please amend the paragraphs beginning at page 5, line 1 through page 6, line 16, as follows:

SUMMARY ~~OF THE INVENTION~~

~~The object of the present invention is to solve the above stated problem.~~

~~The problem is solved by the router according to claim 1 and the method of claim 19 and a computer program product of claims 40 and 41, wherein a distribution of the macro diversity functionality to the routers is proposed.~~

It is proposed to distribute macro diversity functionalities to the routers. The router in an Internet Protocol (IP) based UMTS Terrestrial Radio Access Network (UTRAN) Transport Network within a Universal Mobile Telecommunication System, wherein the UTRAN transport network carries Dedicated Channel (DCH) frames on DCHs between a RNC and at least one Node B comprising means for splitting one DCH traffic flow into at least two

DCH traffic flows by using an IP multicast protocol makes it possible to reduce required transmission resources.

~~The~~ An example method in an Internet Protocol (IP) based UMTS Terrestrial Radio Access Network (UTRAN) Transport Network within a Universal Mobile Telecommunication System, wherein the UTRAN transport network carries Dedicated Channel (DCH) frames on DCHs between a RNC and at least one Node B, ~~comprising according to the present invention the step of~~ comprises splitting one DCH traffic flow into at least two DCH traffic flows by using an IP multicast protocol makes it possible to reduce required transmission resources.

~~The~~ A computer program product that is directly loadable into the internal memory of a computer within a node in a Universal Mobile Telecommunication System, ~~comprising in accordance with the present invention the~~ comprises a software code portions for performing said method which makes it possible to reduce required transmission resources.

The computer program product that is stored on a computer usable medium, ~~comprising in accordance with the present invention~~ comprises a readable program for causing a computer, within a node in a Universal Mobile Telecommunication System to control an execution of said method which makes it possible to reduce required transmission resources.

~~The most~~One important advantage achieved ~~by the present invention~~ is transmission savings in the UTRAN transport network, which translate into significant cost savings for the operator. The transmission savings are realised

through optimised location the DHO functionality. Thereby the redundant data transport is eliminated in the parts of the path, where data pertaining to different macro diversity legs of the same DCH would otherwise be transported in parallel along the same route.

Another advantage ~~of the present invention~~ is that it facilitates that RNCs be located in more central locations of the network (i.e. with less geographical distribution). The main purpose of the current common geographical distribution of RNCs is to limit the transmission costs for the parallel macro diversity legs. When this parallel data transport is eliminated, it becomes more beneficial for an operator to centralise the RNCs, e.g. by co-locating them with MSCs or MGWs. Co-locating several nodes on the same site results in simplified operation and maintenance, which also means reduced costs for the operator.

Please amend the paragraphs beginning at page 7, line 1, as follows:

FIG. 4 illustrates schematically potential transmission savings in a network according to an embodiment of the present invention.

FIG. 5 and FIG. 6 illustrates schematically establishment of a first and second leg according to an embodiment of the present invention.

FIG. 7 and FIG. 8 illustrates schematically ~~the~~ an example combining timing scheme ~~according to the present invention~~.

Please amend the paragraphs beginning at page 7, line 9, as follows:

The ~~present invention~~technology will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, like numbers refer to like elements.

~~The present invention~~ One or more embodiments may be implemented in a UTRAN having an Internet Protocol (IP)-based transport network as illustrated in FIG. 1. The IP based transport network may be controlled by an IP of version 4, 6 or future versions.

In order to reduce the required transmission resources, ~~the present invention proposes~~ it is proposed to distribute the macro diversity functionality to the routers of the UTRAN transport network from the RNCs. When the routers handle the macro diversity, the splitting and combining of the traffics flows may be performed in any router in the transport network. However, it is advantageous to select a transport network router closer to the Node Bs than the RNC. That reduces redundant data paths and save transmission resources, as illustrated in FIG. 4. In this example, the D-RNC is not included in the path of the traffic flow, although it is involved (when applicable) in the Radio

Network Subsystem Application Part (RNSAP) and Node B Application Part (NBAP) signalling when the Dedicated Channel (DCH) is established.

Please amend the paragraphs beginning at page 8, line 10, as follows:

The macro diversity arrangement ~~in accordance with the present invention~~ residing in a UTRAN transport network router comprises a splitting unit. The splitting unit comprises means for splitting a downlink traffic flow, wherein IP multicast is used for the splitting. That implies that ~~the~~ one or more routers ~~according to the present invention~~ in the IP based transport network ~~are required to~~ should be capable of multicasting. Each DCH gets its own multicast tree which is established on demand. The inherent multicast capabilities of the transport network e.g. the Transport Network Layer (TNL) functionality, are used to enable optimised splitting, from a transmission point of view. The downlink connection ~~is hence required to~~ should be a multicast connection. ~~According to the invention, the~~ The RNC is then only required to send a single copy of each DCH FP frame in the downlink connection instead of one for each macro diversity leg as in the prior art. The splitting router performs the splitting by replicating the single copy of each DCH FP frame and transmits the replicated DCH FP frames according to a multicast protocol.

Several multicast routing protocols intended to be used in conjunction with current and future versions of the Internet Protocol may be used. The multicast routing protocols ~~are required to~~ should build multicast trees through which multicast packets are forwarded. Examples of possible

multicast routing protocols are Protocol Independent Multicast-Sparse Mode (PIM-SM), Core Based Trees Multicast Routing version 2 (CBTv2), Distance Vector Multicast Routing protocol version 3 (DVMRPv3) and Multicast Open Shortest Path First (MOSPF). In embodiments of the present invention, PIM-SIM and CBTv2 are preferred.

Please amend the paragraphs beginning at page 9, line 14, as follows:

An ~~essential~~ important component is the Multicast Listener Discovery (MLD) protocol for IPv6. The MLD protocol is used for discovering end hosts, i.e. Node Bs that listen to certain multicast addresses on a link. Thus, the MLD protocol may be used between the Node B and its adjacent router(s). It should be noted that the Internet Group Management Protocol (IGMP) version 1, 2 or 3, ~~must~~ should be used instead of MLD in the case of IPv4.

When a DCH transport bearer is established, the RNC ~~is according to the present invention required to~~ dynamically ~~assign~~ assigns a multicast destination address for the Node B in the downlink for this particular DCH. All RNCs in the UTRAN ~~are~~ can be configured with non-overlapping ranges of multicast addresses. The assigned multicast address is selected from a range that has been configured for the concerned RNC. Each downlink DCH transport bearer will thus have its own dedicated multicast destination address in the Node B. The NBAP and the RNSAP, with modifications, may be used for assigning the multicast addresses~~, however the NBAP and the RNSAP are then required to be modified~~. Thus the multicast address may be a new Information

Element (IE) in messages such as Radio Link Setup Request, Radio Link Reconfiguration Request and Radio Link Reconfiguration Prepare.

Please amend the paragraphs beginning at page 10, line 25 through page 12, line 15, as follows:

There are different ways to make the multicast capable routers aware of the mapping between the multicast addresses and the core routers. Three different ways are explained below. In ~~accordance with a preferred~~ one embodiment ~~of the present invention~~, CBTv2, or PIM-SM bootstrap mechanism is used, which automatically configures CBTv2, or PIM-SM, routers with the information required to map multicast addresses to core routers. In another embodiment, each router is manually configured with multicast address to RNC mapping information. In a further embodiment, NBAP may be modified such that the IP address of the S-RNC, which is the core router, is carried in the Radio Link Setup Request, Radio Link Reconfiguration Request or Radio Link Reconfiguration Prepare message to the Node B when a DCH is established. The Node B may then use the source filter feature of MLD version 3 to convey this core router address i.e. the S-RNC address to the router. In the Multicast Listener Report, the Node B indicates for the concerned multicast address that it is only interested in multicast packets that have the indicated RNC as the source. The router would then interpret this information as an indication of the RNC that is the core router for this multicast tree.

Thus~~ according to the present invention~~, multicast is used for the downlink splitting. Each DCH gets its own multicast tree, which is established on demand. Through the Multicast Listener Discovery (MLD) protocol for IPv6 or the Internet Group Management Protocol (IGMP) version 1, 2 or 3 for IPv4 and either of a number of multicast routing protocols (e.g. PIM-SM or CBTv2) an optimal multicast tree, from a transmission point of view, is built. The downlink traffic is thus forwarded via this multicast tree. The splitting points are distributed optimally (from a transmission point of view) among the routers in the transport network. The procedure is depicted in FIGS. 5 and 6.

Uplink Combining

The macro diversity arrangement residing in a UTRAN transport network router comprises in accordance with one embodiment ~~of the present invention~~ a combining unit. The combining unit comprises means for combining at least two uplink DCH traffic flows into one single uplink DCH traffic flow. However, the combining unit requires more complexity than the splitting unit. The combining function comprises the following:

a) means for detecting that a router is a splitting/combination point.

b) means for identifying the uplink flows that should be combined.

c) means for performing the actual combination of DCH FP frames.

d) means for managing a timing scheme required to prevent a combining router from waiting an indefinite time period for an outstanding frame.

Identifying a Splitting/Combination Point

Provided that the multicast routing protocol uses the reverse path forwarding principle in the multicast tree building process, which both CBTv2 and PIM-SM do, a router being a splitting point in the downlink multicast tree, i.e. comprising a splitting unit, is also ~~being~~ a combination point for the uplink unicast flows, i.e. comprising a combination unit. Thus if a router comprises means for detecting that it is a splitting point, it comprises automatically means for detecting that it is a combination point.

A splitting point is characterised by the fact that there is more than one listener in the downlink direction. By means of functionality of CBTv2 and MLD, a router is able to keep track of joining and leaving nodes and thereby able to determine the number of listeners it has for a specific multicast address. The MLD protocol may in some cases require a modification in order to be able to determine the correct number of listeners. The cases when the modification is required are when multiple Node Bs are connected to the same router via a common multi-access link, e.g. an Ethernet link. In this situation the listener report suppression mechanism of MLD must be eliminated <u>or disabled</u>. Otherwise a Node B would not send a planned listener report to the router, if another Node B on the same link has recently sent a listener report for the same multicast group. The result would be that the router would not know the number of listeners for the multicast group on the link.

Please amend the paragraphs beginning at page 13, line 6, as follows:

In order to ~~perform the combination of~~ combine two or more legs in the uplink, a router ~~has to comprise~~ can include means for identifying the uplink flows that corresponds to a certain downlink multicast tree. In ~~the preferred~~ an embodiment ~~of the present invention~~, the multicast address assigned as the downlink destination address is used also as the source address of the packets sent in the uplink from all participating Node Bs. Thus, the RNC assigns the unique multicast destination address for each DCH downlink as described above. If all participating Node Bs use this multicast address as source address for the corresponding uplink, the UTRAN transport network router is then able to identify packets belonging to different uplink flows. This method is simple, but it requires however that IPv6 routers are modified, since the current IPv6 standard discards packets having a multicast address as the source address. The situation is similar for IPv4 and IPv4 routers.

When the DCH FP control frames of the Node Synchronisation procedure are sent on the same transport bearers as the corresponding data DCH FP frames, the RNC ~~is required to identify~~ identifies from which Node B a received DCH FP control frame originates. The type of frames for which this is relevant is limited to uplink node synchronisation control frames. In current UTRANs, where the transport bearer of each macro diversity leg is terminated in the RNC, the identity of the originating node B is implicitly indicated by the transport bearer on which the frame was received. However, when the DHO functionality is distributed according to one or more embodiments of the

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present invention, this method cannot be used. Instead, another method that may be used for identifying the originating Node B, is that the RNC assigns a destination address and a destination port to be used in the uplink using parameters which are already specified in NBAP, in addition to assigning the multicast address when the DCH is established. The normal behaviour would be to assign the same destination address, but a unique destination port for each leg in the active set of a DCH uplink. However, it would also be possible to assign the same destination port to all legs. One reason to choose the latter approach is to reduce the risk that the port numbers become a limiting resource in very large RNCs.

Please amend the paragraph beginning at page 14, line 15, as follows:

However, if it were preferred to use the same uplink destination port for all legs, the originating Node B can only be identified by the source data in the IP and UDP headers, if the same uplink destination port is used for all the legs. Since the source address is the same for all legs, only the source port remains as a distinguishing indicator. To ensure that the source ports of all the legs are different, they ~~must~~ should be assigned by the RNC. This would be performed via NBAP as each leg is established. Thus the identification of the originating Node B of an uplink DCH frame is based on a source UDP port assigned by the RNC to the Node B for the uplink of the DCH.

Please amend the paragraphs beginning at page 15, line 5, as follows:

~~In accordance with one embodiment of the present invention, a~~ A second method for identifying the uplink flows is to retrieve the destination address and the destination port(s) of the uplink flows from the RNC. The destination address is already known to the router, since the destination address is the core router of the downlink multicast tree, but the destination port information ~~has to~~ should be explicitly signalled from the router. This information may be included when the frame format information is transferred to the router.

If all the legs use the same uplink destination ports, this is all that is ~~required~~ necessary. However, if the legs use different uplink destination ports, transferring the port information together with the frame format information would not be ~~enough~~ sufficient. In such case, a combining router ~~would have to~~ should retrieve the port information from the RNC every time a new branch in the multicast tree is added to the router.

Please amend the paragraphs beginning at page 16, line 1, as follows:

In accordance with a further embodiment ~~of the present invention~~, a third method of identifying the uplink flows is to use an uplink flow identity implicit in the downlink flow. By using this method, it is possible for a combining router to identify the uplink flows through the uplink destination address and destination UDP port without explicit signalling from the RNC. In order for this to work the RNC ~~must~~ should assign the same uplink destination address and port to all the Node Bs in the active set and this address-port pair

must be the same as the source address-port pair used in the downlink. Then a combining router is adapted to retrieve the uplink destination address and port by looking at the source address and port of a downlink packet. Since a common uplink destination port for all legs is required in this method, identification of the originating Node B ~~is required to~~ should be based on the uplink source address. However, using separate unicast transport bearer for node synchronisation control frames eliminates the need for identification of the originating Node B.

In accordance with a further embodiment ~~of the present invention~~, a fourth method of identifying the uplink flows is to modify the MLD (or IGMP) protocol and the multicast routing protocol such that the destination port of the uplink is included in the messages that are used to build the multicast tree (e.g. the Multicast Listener Report messages of the MLD protocol and the JOIN_REQUEST messages of CBTv2).

Please amend the paragraphs beginning at page 17, line 1 through page 20, line 1, as follows:

When a router has detected that it is a combination point, it should ~~according to the present invention immediately~~ initiate selective combining of the concerned uplink flows, preferably immediately. The principle of the actual combining is similar in some aspects to the actual combining ~~according to prior art (that is~~ performed in the conventional RNC~~)~~. The main difference is that the

combining router performs the combining instead of the RNC. The combining procedure differs for non-voice DCHs and voice DCHs ~~as in the prior art~~.

If the DCH for which the router has detected that it is a combination point, is a non-voice DCH, the router ~~is required to retrieve~~ retrieves frame format information from the RNC before it ~~is able to initiate~~ initiates the combination. This is ~~due to that~~because the unit of selection for non-voice DCHs is a TB, which represents only a fraction of a DCH FP frame and thus only a fraction of a UDP packet as described above. The TBs are described by the Transport Format Indicator (TFI) in each frame.

To retrieve the ~~required~~ format information the router contacts the RNC ~~that is the core router~~ of the downlink multicast tree using a new application level protocol. An application level protocol is a protocol running above the transport level in the protocol stack, i.e. above a transport protocol such as User Datagram Protocol (UDP), Transmission Control Protocol (TCP) or Stream Control Transmission Protocol (SCTP). An example of an application level protocol is HyperText Transfer Protocol (HTTP), but the application level protocols comprise several protocols. The information that is required in order to perform the combination by the router is the TFIs that will be used for the DCH and how each of them maps to the number of TBs and the TB size (or the TB set size). The TFIs ~~cannot be~~ are not preconfigured in the routers, since the interpretation of a TFI is dynamic, and may possibly vary from DCH to DCH. The TFI is signalled from the RNC to a Node B via NBAP. The Transmission Time Interval (TTI) for the DCH may also be useful for the timing algorithm,

which is described further below, and thus a router may retrieve the TTI from the RNC together with the frame format information.

When the router ~~has retrieved~~ retrieves the frame format information it is able to identify the individual TBs, their associated CRCIs and the QE parameter of each frame in the uplink flows. The router uses the ability to select TBs in a similar manner as the RNC currently does. ~~Similar to the RNC, the~~ The router ~~has to check~~ checks the frame type indicator in the frame header, in order to avoid trying to combine control frames and the CFN to ensure that all received candidate frames have the same CFN value. To extract the frame type and the CFN is ~~trivial~~ relatively simple since they have fixed positions in the frame header. The actual combining described above ~~is~~ can be performed ~~according to prior art~~ conventionally. A difference between ~~the present invention and the prior art~~ is however, that the router builds a new frame and places the new frame in a new UDP packet and sends it towards the RNC.

The header of the new frame will be the same as in all the received candidate frames and the TBs and their CRCIs will be the selected ones. The combining router selects the best (greatest) of the Quality Estimate (QE) values of the candidate frames to be included in the QE field of the new frame. If the optional payload CRC is used the router ~~has to calculate~~ calculates a new payload CRC for the new frame. The frame header consists of a header CRC, a frame type indicator, the CFN and transport format indicators. This header is not dependent on the quality of the data in the payload. Thus, the header ~~is~~

~~the~~can be same in all candidate frames. Candidate frames ~~implies~~ imply in this specification all the frames with the same CFN that in a sense are candidates for providing the best quality data to be selected in the combining procedure. Since the header is the same in all candidate frames, the header will also ~~retain~~ remain unchanged in the resulting combined frame. The payloads of the candidate frames, however, comprise Transport Blocks (TBs), whose quality may vary. The quality of a certain TB is indicated by its associated CRC Indicator (CRCI). The CRCI indicates whether a TB has passed the CRC check when it was received by the base station over the radio interface. In addition, the QE indicates the overall quality of the frame. The QE is measured in the base station, roughly corresponding to the period of time from which the contents of the frame originate. The QE value ~~is~~ can be associated with the bit error rates. The TBs are selected individually from all the candidate frames. When a TB is selected from candidate frame X, the associated CRCI in frame X is also selected. Thus, the header of the combined frame is the same as of the candidate frames and the TBs of the candidate frame are the selected TBs.

In the prior art, the result of the combining is not forwarded in a frame. Thus in prior art combining, no QE parameter ~~has to be~~ is selected to be forwarded. However, in the combining according to an embodiment ~~of the present invention~~, a QE parameter ~~has to be~~ is included in the combined frame. Thus a rule for how to select the QE parameter ~~has to be~~ is provided ~~in accordance with an embodiment of the present invention~~. In a preferred embodiment ~~of the present invention~~, the best (greatest) QE parameter of the

candidate frames is selected. The selection is based on that the quality of the combined frame will normally be better than the quality of the best of the candidate frames. Hence, it is reasonable that the QE parameter of the combined frame is at least as great as the greatest QE parameter of the candidate frames.

When the combined frame is built, the router ~~has to include~~ includes the combined frame in the new UDP packet as described above. If the UDP source and/or destination ports are different for the different legs, as described above, and thus for different candidate frames, the router ~~has to select~~ selects the source and destination ports from one of the received candidate frames. In a preferred embodiment ~~of the present invention~~ it uses the same port numbers for all the new UDP packets in the flow, because this is ~~the most~~ an optimal way for the IP/UDP header compression. Subsequently, the router ~~has to calculate~~ calculates a new UDP checksum before the UDP packet is sent to the RNC.

The combination procedure for voice DCHs is optimised compared to the case with non-voice DCHs. As long as the number of transport blocks is fixed in a voice DCH FP data frame, the router does not have to retrieve any frame format information from the RNC. The router also does ~~neither~~ not have to retrieve the TTI, which also is fixed and predictable, e.g. 20 ms, for voice DCHs. Thus no information has to be retrieved from the RNC. The required knowledge about the TTI and the frame format for voice DCHs may be preconfigured in the router.

Please amend the paragraphs beginning at page 20, line 18 through page 22, line 11, as follows:

A second optimisation for the procedure with voice DCHs compared with non voice DCHs is that the router does not have to build a new frame and a new UDP packet. This is because the unit of selection is ~~an~~ the entire frame, which corresponds to an entire UDP packet. Thus, the router according to one embodiment ~~of the invention~~ comprises means for detecting that it is a combination point, identifying the uplink flows, performing the selection and sending the selected UDP packet (i.e. the selected frame) entirely without contact with the RNC when the combined DCH is a voice DCH. If the source and destination ports are not the same for all legs, a possible optimisation may be to ~~let~~ allow the router change the port numbers in the UDP header of the selected packet and recalculate the UDP checksum, so that all the selected UDP packets get the same source and destination ports. From an IP/UDP header compression perspective, this is preferred since it is more optimal than varying port numbers.

In order to make the combining router independent of the RNC, the combining router ~~requires~~ can include means for distinguishing between a voice DCH and a non-voice DCH. A simple way to indicate the DCH type is ~~according to one embodiment of the present invention~~ to use dedicated uplink multicast source addresses, which are equal to the downlink destination multicast address for voice DCHs. E.g., voice DCHs may use odd multicast source addresses while other DCHs use even multicast addresses. Still another

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way according to another embodiment of the present invention is to use dedicated uplink destination or source ports, e.g. odd numbered ports for voice DCHs and even numbered ports for other DCHs. It is also possible to use the downlink destination port, one default port for voice and one default port for non-voice according to a further embodiment of the present invention. However, in this case the router would ~~have to~~ wait for the first downlink packet in order to determine the type of the DCH.

Since the actual combining of voice DCHs is less complex than the combining of non voice DCHs, according to one embodiment ~~of the present invention~~ the routers may only be able to perform the uplink combining for the voice DCHs, and the non voice DCHs are combined in the RNC in accordance with prior art.

Timing Scheme for the Uplink Frame Combining

The timing of the frame combining is associated with the problem ~~to know~~ of knowing how long to wait for outstanding candidate frames to arrive. The shorter waiting time, the greater is the risk that a late arriving candidate frame is missed. On the other hand, if the waiting time is too long, the resulting combined frame may arrive too late at the RNC or at a later combination point. It should be noted that the RNC and the Node B are synchronised by means of previously defined procedures, but these synchronisation procedures do not include the transport network routers.

The difficulties with the timing of the combination originates from that the routers are not synchronised with the Node Bs and the RNCs. A

consequence of this is that the combining router is not able to easily define a time of arrival window for the frames to be combined. The trigger point ~~has to~~ should be the first of the candidate frames that arrive. The router ~~is~~ then ~~required to wait~~ waits for the remaining candidate frame(s) to arrive from the other leg(s). When the combination is performed in the RNC as in the prior art, the RNC waits until the end of the TTI, but the router does not have any such reference timing.

~~Ideally~~Preferably, the last candidate frame arrives while the router is waiting, the router combines the frames and sends the result. However, the problem arises when one (or more) of the frames does not arrive at all. The router ~~is then required to~~ should have a maximum waiting time defined. Even though it is quite possible to define a maximum waiting time to be e.g. one third of the minimum TTI, that waiting time ~~is useless~~ not very useful. ~~The useless~~ Such waiting time ~~inevitably~~ increases the maximum delay of the transport network. The delay variation also increases, unless the router always waits until the maximum waiting time has expired, even when all the candidate frames have arrived.

Please amend the paragraph beginning at page 23, line 6, as follows:

One way to overcome the above stated problem is ~~according to the present invention to let~~ to allow the combining router define an adaptive latest accepted time of arrival (LAToA) for a set of frames to be combined, i.e. the expected frames with a certain Connection Frame Number (CFN). ~~The object~~

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One purpose is to adapt the LAToA to the maximum transport delay that a frame is allowed to experience on its path from the Node B to the combining router, assuming that this transport delay very seldom exceeds the maximum allowed transport delay as stipulated by standard requirements. In order to be able to define a reasonable LAToA, the combination router is ~~required~~ preferred to be aware of the TTI for the connection. The TTI is retrieved from the RNC together with the required information about the DCH FP frame formats as described above. For voice DCHs, the TTI may be preconfigured in the router, similar to the frame format, since the TTI always is 20 ms for voice DCHs.

Please amend the paragraph beginning at page 24, line 10, as follows:

The below stated general rules for subsequent CFNs are ~~according to the present invention~~ divided into two different cases:

1. All candidate frames for CFN_n arrive before $LAToA_n$.

In this case, if the time of arrival of the last combined frame for CFN_n, $ToAoLCF_n$, was later than, or equal to, $LAToA_n$-Δ, i.e. $LAToA_n-\Delta \leq ToAoLCF_n \leq LAToA_n$, then $LAToA_{n+1}$ is set to $LAToA_{n+1}=ToAoLCF_n+TTI+\Delta$. Otherwise, if the last combined frame arrived before $LAToA_n$-Δ, i.e. $ToAoLCF_n<LAToA_n-\Delta$, $LAToA_{n+1}$ is set to $LAToA_{n+1}=LAToA_n+TTI-\delta$, where δ is a fraction of Δ. According to another embodiment, an additional rule to this general rule is that if $LAToA-\Delta-\delta<ToAoLCF_n \leq LAToA-\Delta$, then $LAToA_{n+1}$ is set to $LAToA_{n+1}=LAToA_n+TTI$.

2. Not all candidate frames for CFN_n arrive before $LAToA_n$.

Please amend the paragraphs beginning at page 25, line 29 through page 26, line 16, as follows:

A disadvantage is that data, albeit small packets, is unnecessarily transmitted. This would occur even when the connection is not in a macro diversity mode, unless a signalling message is introduced to remotely turn this function on and off from the RNC. Even though the superfluous packets would very small, thanks to efficient header compression, it would still counteract the ~~very main purpose~~ one of the purposes of the present invention to move macro diversity functionality to a router of the transport network. Another disadvantage is that if the rare event of a lost frame in the transport network occurs, the combining router will keep waiting for the lost frame and consequently all the frames with that CFN will be wasted.

Thus, the method in an IP based UTRAN Transport Network within a UMTS, wherein the UTRAN transport network carries Dedicated Channel (DCH) frames on DCHs between a RNC and at least one Node B, comprises ~~in accordance with the present invention the step of~~:

splitting one DCH traffic flow into at least two DCH traffic flows by using an IP multicast protocol.

The method and thus functionality of the RNC and the routers used ~~in the present invention~~ may be implemented by a computer program product. The computer program product is directly loadable into the internal memory of a computer within one or more nodes, e.g. a router or a server, in the mobile telecommunication network ~~according to the present invention~~, comprising the

software code portions for performing the steps of the method~~ according to the present invention~~. The computer program product is further stored on a computer usable medium, comprising readable program for causing a computer, within a router, server, RNC or Node B in the mobile telecommunication network~~ according to the present invention~~, to control an execution of the steps of the method~~ of the present invention~~.